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None

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INT CL⁵ **A47B 96/00 96/06**

(54) **Bracket**

(57) A bracket for securing together a plurality of elements, and suitable for mounting a baluster rail element upon a newel post element in a staircase construction, utilises rectangular bracket arm plates (11, 12) for the respective elements (30, 40), coupled together at a variable relative orientation (20), by a co-operative interfitting lug (26) and aperture configuration (15, 16) – over which they may be secured together by securing the individual plates to their respective elements.

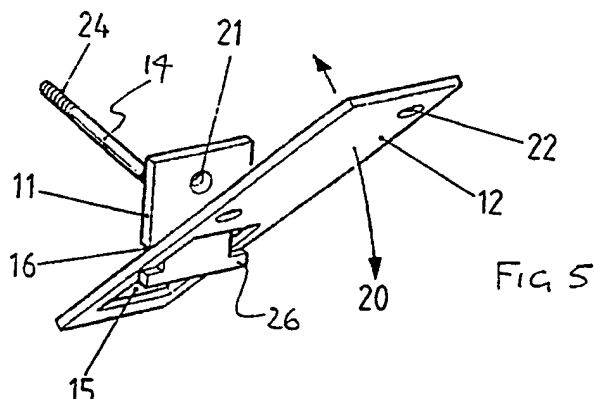
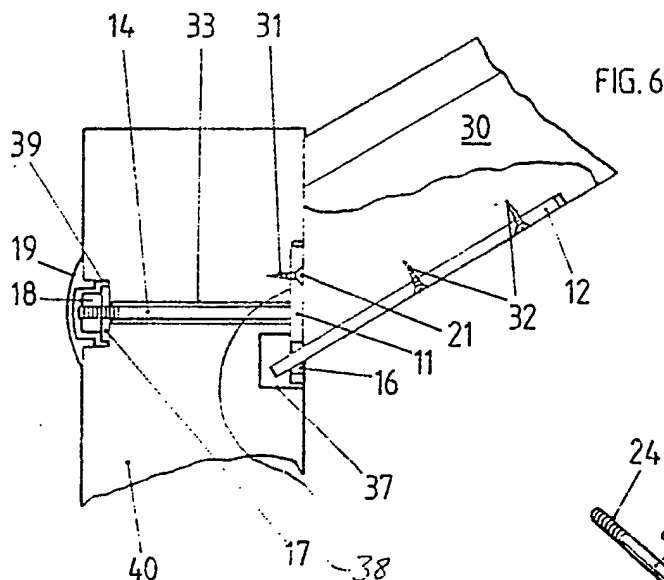


FIG. 1

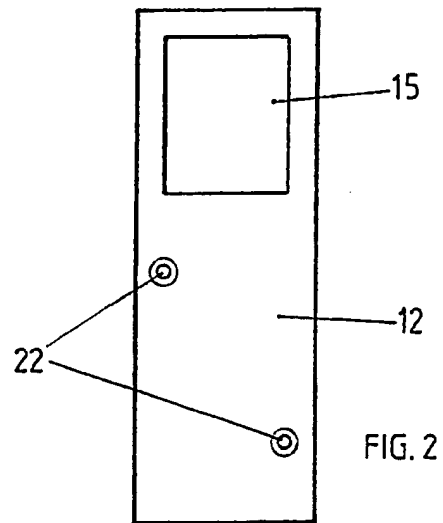
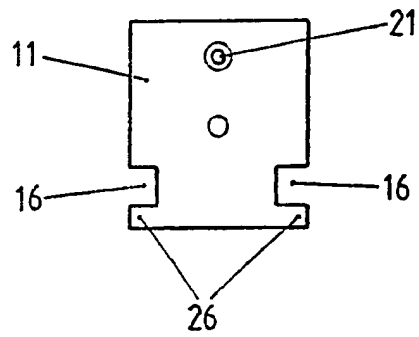


FIG. 2

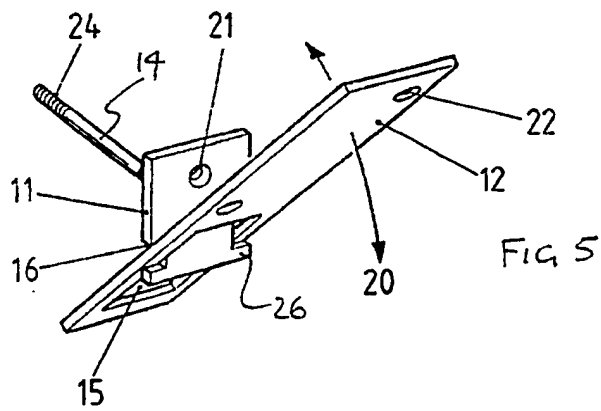


FIG. 5

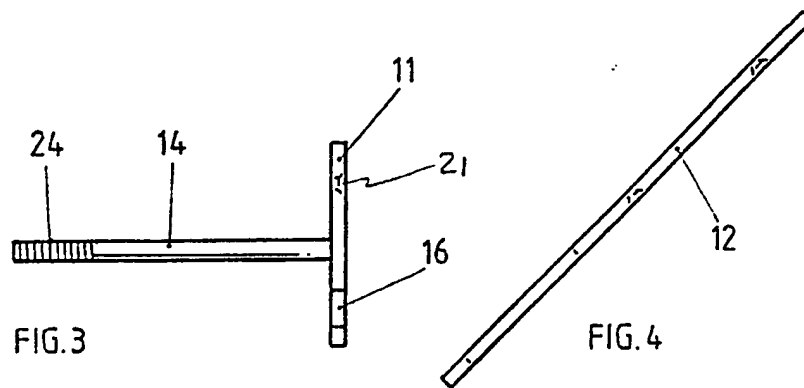


FIG. 3

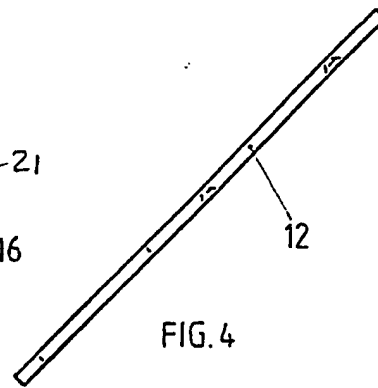
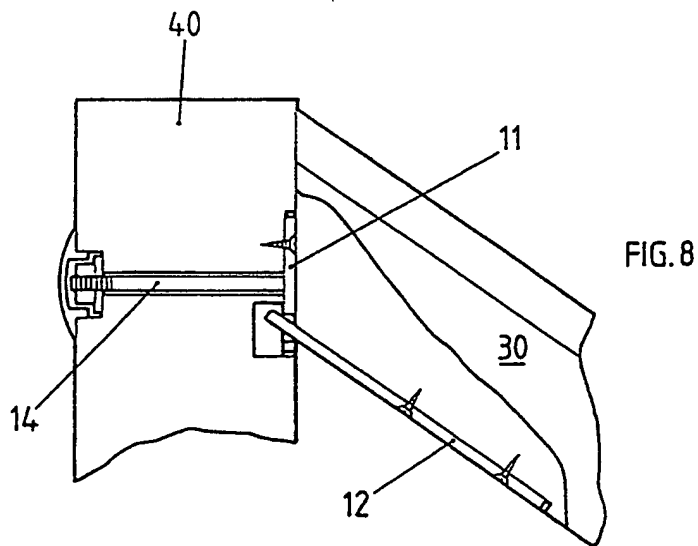
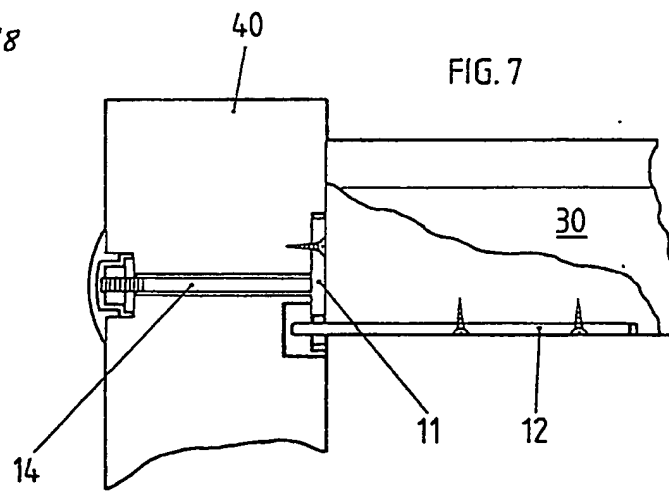
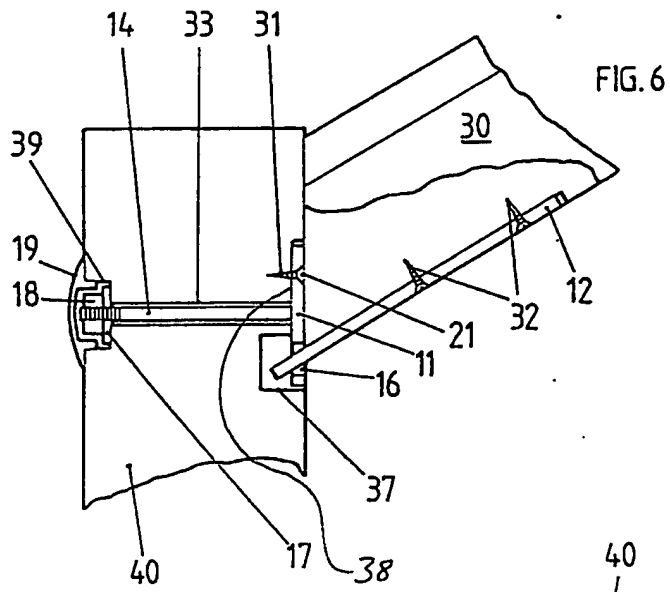


FIG. 4



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Staircase Bracket Fixing System

5 This invention relates to brackets, and is particularly, but not exclusively, concerned with brackets for joining multiple - ie two or more - individual elements, whose relative disposition and orientation may be altered prior to fixing, for example to allow final positional alteration or adjustment.

10 Such positional alteration is accommodated by corresponding movement of up till then loosely intercoupled bracket elements, before fastening those elements securely together - whereupon it is desirable to preserve the set relative position and orientation, for the both the bracket parts and the elements to be secured thereby.

15 The term 'bracket' is employed herein generally to embrace any form of connector, tie, link, joint, brace or support, of whatever configuration.

20 A vast disparity of adjustable and/or demountable brackets have been proposed hitherto, but typically have employed elaborate captive hinge, pivot or swivel arrangements, which are costly to fabricate and ultimately do not have the necessary flexibility for use in a sufficient variety of different circumstances.

Moreover, the relatively movable hinge elements are typically coupled together in such a manner that they cannot readily be separated.

25 This means that the elements to be bracketed together must be brought together with the entire (assembled) bracket - and so cannot be fastened separately and remotely to individual bracket parts.

30 If such separation is admitted initially - eg with a separable hinge (such as, say, a so-called 'rising butt' or pin and collar arrangement), it is difficult to inhibit it (automatically) after bracket fastening.

Some aspects of the invention are concerned with a particular mounting problem arising in the construction of staircase balustrading - specifically, the problem posed by the attachment

of a baluster rail end to a support upright, such as a turned newel post.

A concealed fixing is desirable in such an environment, to preserve the aesthetics of the balustrading.

5 Hitherto this has been performed by on-site carpentry (eg a timber joint) and proprietary fasteners, such as screws, or by bespoke (recessed) brackets, as taught in our previous UK Patent No. 2147022.

10 In the latter, an angled plate is prefabricated with two bracket arm portions at a predetermined desired relative mounting angle of the baluster rail and newel post.

A stud is welded to one arm of the bracket and locates within a transverse hole in the head of the newel post and is bolted in situ from the other side.

15 The other arm is mounted in a recess on the underside of the baluster rail and secured with screw fasteners.

As the newel is generally vertically upright, this means setting the bracket angle at an included angle 'representing' the desired inclination of the baluster to the horizontal.

20 This would be parallel to the stair flight - whose steepness is determined by building regulations for new construction.

25 Some limited variation in baluster mounting angle may be accommodated by bending the bracket manually on-site, but undue flexing for such adjustment and correction, tends to weaken the bracket.

Similarly, the downward loads in use are taken in shear across the original bracket fold line, which is potentially weakened by undue or repeated bending.

30 Some aspects of the present invention are concerned with a development or refinement of the basic baluster to newel mounting bracket originally devised by us.

According to one aspect of the invention, there is provided a bracket, for mounting a baluster rail upon a newel post, and comprising

a bracket arm in the form of a plate for attachment to a baluster rail

and a separate bracket arm in the form of a mounting stud and a transverse plate for attachment to a newel post;

5 the bracket arms being loosely inter-connectable, one within the localised embrace of the other,

by an aperture in one of the plates

in which is locatable a localised waisted region of the other plate,

10 to form an open linked coupling,

which admits of relative angular movement to provide coupled bracket arm adjustment.

15 In a particular construction, one end of one bracket arm - once installed - abuts the wall of a recess in the element associated with the other bracket arm and is effectively braced or wedged in position against the other bracket arm.

20 In some constructions, the bracket arms may be attached to respective elements and coupled together thereafter - but, for more intimate and concealed bracket fixing, it may be desirable first to couple the bracket arms together and then attach those arms loosely to their respective elements.

According to another aspect of the invention, a bracket comprises an arm

with an aperture for locating

25 another arm

with localised opposed re-entrant peripheral wall portions, defining spaced restraining lugs - in the manner of a bayonet socket - to locate the walls of the aperture in the first arm

30 each arm incorporating means to facilitate securing it to an associate element to be intercoupled with an element secured to

the other arm.

Such a bracket may be essentially self-tightening or self-locking.

5 That is to say, when the various (coupled) bracket arms are tightly secured to their respective or associated elements, so that very act of tightening draws the bracket arms securely into locking abutment with those elements - and so subsequent relative movement of those elements is inhibited.

10 This can be achieved for a variety of different relative initial orientations of the bracket arms and their associated elements - and this orientation is preserved through tightening.

Thus no separate bracket hinge lock, latch or bracing stay is required.

15 Nor is pre-tightening of the bracket arms necessary before mounting them upon the elements to be bracketed together.

There now follows a description of some particular embodiments of the invention, by way of example only, with reference to the accompanying diagrammatic and schematic drawings, in which:

Figure 1 shows a plan view of a bracket arm;

5 Figure 2 shows a plan view of another bracket arm for co-operative engagement with the bracket arm of Figure 1;

Figure 3 shows a side elevation of the bracket arm shown in Figure 1;

10 Figure 4 shows a side elevation of the bracket arm shown in Figure 2;

Figure 5 shows the bracket arms of Figures 1 and 2 co-operatively, but loosely, inter-coupled, ready for mounting upon associated elements (not shown) to be bracketed together;

15 Figure 6 shows a part-sectioned, part-cut away, view of the coupled bracket arms of Figure 5, mounted for a staircase construction upon a newel post and baluster rail;

Figure 7 shows an alternative relative orientation of bracket arms and associated newel and baluster elements to that shown in Figure 6;

20 Figure 8 shows yet another bracket arm orientation to that shown in Figures 6 and 7; and

Figure 9 shows a perspective view of the bracket arm arrangement of Figure 6.

25 Referring to the drawings, and in particular Figure 1, a bracket arm 11 comprises a flat generally rectangular configuration plate with a locally 'waisted' section formed by a pair of opposed indents or notches 16, defining spaced opposed lugs 26.

30 A stud 14, with a thread 24 extending at least from its outer end, is welded to one side of the plate 11 and stands orthogonally therefrom, as shown in Figure 3.

Another bracket arm, shown in Figure 2, comprises an elongate generally rectangular outline configuration plate 12 with a rectangular aperture 15 at one end.

- 5 The lateral extent of the aperture 15 corresponds to the lateral spacing of the notches 16, so that the plate 12 can be brought or 'threaded' over the plate 11, by a twisting action to bring the length or at least the diagonal span of the aperture 15 temporarily over the entire width of the plate 11.
- The plates 11 and 12 can thereby be coupled loosely together, as shown in Figure 5, ready for mounting upon associated elements (shown in Figures 6 through 9) to be bracketed together thereby.
- 10 The facility for relative angular movement, or tilting, of the initially loosely linked plates 11 and 12 is indicated by arcuate arrows 20 - this being the prime adjustment, although some minor lateral slackness of fit between the plates and similarly swivelling of the plates in their respective planes may also be accommodated.
- 15 Provision is made, by virtue of fastener aperture 21 in the plate 11, and similar paired fastener apertures 22 in the plate 12, for securing the bracket arms to individual elements, by proprietary fasteners, such as wood screws in the case of timber elements.
- 20 For ultimate strength, the plates 11 and 12 are conveniently fabricated from metal - for example by stamping directly out of sheet material, or in some circumstances, where only light loads prevail, may instead be moulded from synthetic plastics material, such as nylon.
- 25 It should be appreciated that other configurations - eg with a rounded profile - of plates 11, 12 are possible according to the nature of the elements to be bracketed together.
- Moreover, more than two plates can be coupled together on the same principle - or indeed a series or chain of interconnected plates may be deployed.
- 30 Figures 6 through 9 show specific examples of elements bracketed together for a staircase construction, in which a timber baluster (or hand) rail 30 is to be securely mounted at a prescribed angle to a support upright in the form of a timber newel post 40.
- 35 Certain preliminary preparatory carpentry work is necessary to each element - namely a through-hole 33 in the head of the newel post 40 and a recess 39 at one end for receiving a lock nut 18 and bearing washer 17 for the threaded stud 14 and a recess 38 at the opposite end for a plate 11.

The recess 38 is enlarged into a chamber 37 for receiving the end of a plate 12 coupled to the plate 11 in the manner of Figure 5.

The plate 11 is secured to the newel 40 by a screw 31 located in the fastener aperture 21 therein.

5 Similarly the plate 12 is secured to the underside of the baluster rail 30 by a pair of screws 32.

In fact, the plate 12 is located in a recess 29 in the underside of the baluster 30.

10 A finishing cap 19, for example of moulded synthetic plastics material, is fitted over the aperture 39.

Figure 6 represents the mounting configuration of a baluster 30 running upwardly away from, or downwardly towards, a lower newel post 40, at an acute (ie less than 90 degree) angle.

15 Figure 7 represents another orientation of the baluster 30, namely at right angles (ie 90 degrees) to the newel 40 - as would be the case, for example, at the end of a straight landing baluster.

20 Figure 8 shows a baluster 30 running downwardly from, or upwardly to, a newel 40, that is with the plates 11 and 12 at an obtuse (ie greater than 90 degree) angle.

The same reference numerals are used in Figures 6 through 9 to depict corresponding parts, albeit differently orientated.

Figure 9 corresponds to the Figure 6 configuration and is included for clarity of illustration.

25 It should be appreciated that the brackets 11 and 12 may be reversed.

30 Moreover the end of the bracket 12 need not contact the walls of the associated recess 37, since tightening of the bolt 14 and nut 18 after fitting the fastener 31, draws the bracket 11 against the walls of its associated recess 38 - and with it the end of the bracket 11. If the latter is secured by fasteners 32 to the walls of the associated recess 29 in the baluster rail 30.

Similarly, the sequence of mounting and tightening operations may

5 be varied - but one possibility would be initially coupling together the brackets 11 and 12 and then attaching them with the fasteners 31, 32, before introducing the threaded bolt shank 14 of the bracket 11 into the bore 33 in the head of the newel 40. The final operation is thus threaded installation and tightening of the nut 18.

Claims

1.

5 A bracket comprising a plurality of bracket arms which individually may be loosely intercoupled by threading a locally waisted portion of one arm through an aperture in another arm.

2.

10 A baluster rail to newel post mounting system comprising a bracket of two plate elements, one with an aperture, the other with opposed indented side edges forming depending lugs, whereby the plates may be freely coupled together - in the manner of a bayonet and socket - in a variable relative orientation, and, once secured respectively to baluster rail and newel post, the coupled bracket is effectively locked in a particular set
15 orientation to preserve a corresponding orientation of those elements.

3.

A bracket substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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GB 9124828.6

Relevant Technical fields

(i) UK Cl (Edition L) A4B

(ii) Int Cl (Edition 5) A47B 96/00, 96/06

Search Examiner

MR K MILNE

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

28 JANUARY 1993

Documents considered relevant following a search in respect of claims 1-2

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages	Relevant to claim(s)

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